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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HAROLD N. ROSENSTOCK and NEHRU BHANDARU

Appeal 2009-010898
Application 10/676,746
Technology Center 2400

Before JAY P. LUCAS, THU A. DANG, and
JAMES R. HUGHES, *Administrative Patent Judges*.

DANG, *Administrative Patent Judge*.

DECISION ON APPEAL

I. STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a Final Rejection of claims 1-29. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

A. INVENTION

Appellants' invention relates to a method for deriving database elements to be stored on the subnet manager; wherein, the database elements are independent of which subnet manager assumes the master subnet manager function (Abstract).

B. ILLUSTRATIVE CLAIM

Claim 1 is exemplary:

1. A method for managing a set of database elements in an INFINIBAND architecture utilizing a plurality of subnet managers, each subnet manager capable of assuming a master subnet manager function, comprising:

 assummg, by one of the plurality of subnet managers, the master subnet manager function;

 storing the set of database elements in the assuming subnet manager;

 replicating the set of database elements in a subnet manager not assuming the master subnet manager function;

 updating the replicated set of database elements if any changes are made to the set of database elements; and

computing derived database elements independent of which of the plurality of subnet managers assumes the master subnet manager function.

C. REJECTION

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Meyer US 2002/0188711 A1 Dec. 12, 2002

Kodialam US 6,778,531 B1 Aug. 17, 2004
(Filed Sep. 29, 20000)

G. Pfister, "InfiniBand™ Management Interoperability" January 7, 2003, from infinibandta.org ("Pfister").

V. Kashyap, "IP over InfiniBand (IPoIB) Architecture" Internet Draft, December 15, 2001, 25 pages, from ietf.org ("Kashyap").

Claims 1-6, 8-15, 17-25, and 27-29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pfister in view of Kodialam.

Claims 7, 16, and 26 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Pfister in view of Kodialam and Kashyap.

II. ISSUE

The dispositive issue before us is whether the Examiner has erred in determining that the combination of Pfister and Kodialam teaches or would have suggested "computing derived database elements *independent* of which of the plurality of subnet managers assumes the master subnet manager function" (claim 1, emphasis added).

III. FINDINGS OF FACT

The following Findings of Fact (FF) are shown by a preponderance of the evidence.

The Invention

1. According to Appellants, the invention is directed to a standby subnet manger that generates derived database elements 752 using a database algorithm, including local identifier assignment 754, tree determination 756 (root for multi-cast tree selection), and (unicast or multicast) forwarding table assignment 758 (Dijkstra's all-sources-single destination or all destinations-single source algorithm) (Spec.19:15-20:31).

Pfister

2. Pfister is directed to InfiniBand Architecture (IBA) subnet management having a switchover (shared storage) approach and a replication approach for maintaining the data within the network; wherein, for the replication approach, each subnet manager maintains a separate copy of the data having an independent data format and the data is synchronized amongst the master and standby subnet managers (p7-8).

Kodialam

3. Kodialam is directed to a packet network having data packets that are routed along paths through a network of nodes interconnected by links from a source to a set of receivers based on a multicast routing tree; wherein, the routing algorithms route the data around paths that have relative low capacity or may be considered critical links (col. 3, ll. 50-63).

4. The network employs interior routing protocols to exchange network topology information with the network nodes; wherein, each node may derive its own forwarding table 610 based upon the network topology

information that it receives from the centralized network management system 620 (col. 1, ll. 37-65; col. 15, ll. 1-10).

5. The forwarding table defines the network paths for sending each data packet to the next node in the path on to its destination (col. 1, ll. 56-60).

6. The multicast forwarding tables may be derived at each node from the multicast routing tree generated using various routing algorithms, such as, a Max-Multicast Flow algorithm or a Nearest Node First algorithm which both employ Dijkstra's shortest path algorithm; wherein, the database elements are related to multicast trees and forwarding tables (Figs 4-6; col. 14, ll. 46-50; col. 8, ll. 57-67; col. 13, ll. 10-18; and col. 9, ll. 33-37).

7. Each of the nodes N1-N11 includes one or more corresponding routers that forward packets based on a forwarding table of a multicast routing tree constructed in accordance with the multicast routing method (which determines the path of a packet through the network) (Fig. 3; col. 5, ll. 1-4).

IV. ANALYSIS

Claims 1-6, 8-15, 17-25, and 27-29

Appellants do not provide a separate argument with respect to independent claims 1, 11, and 20 (App. Br. 7-10). Appellants do not provide arguments with respect to dependent claims 2-6, 8-10, 12-15, 17-19, 21-25, and 27-29. Accordingly, we select claim 1 as being representative of the claims. *See* 37 C.F.R. § 41.37(c)(1)(vii).

Appellants contend that the Examiner "fails to provide a reason why one of ordinary skill in the art would consider modifying the method of

Pfister by further providing derived database elements” (App. Br. 7). According to Appellants, “Kodialam can be applied only after one of ordinary skill in the art finds a reason to provide derived versions of database to Pfister and when he is further searching for known techniques for computing derived versions of database elements” (App. Br. 7-8).

Appellants contend further that since “Pfister further explicitly teaches that ‘it can be said, with a significant degree of certainty, that the two methods outlined above are the only ways to achieve failover without data corruption,’” that “Pfister actually teaches away from any further searching for different methods for maintaining consistent data” (App. Br. 8). According to Appellants, “the Examiner's reliance on the Kodialam reference ... is misplaced” (App. Br. 8), because “[t]here is no teaching in the Kodialam reference directed to the replication method as taught by Pfister” (App. Br. 9). Appellants finally contend that “[b]ecause Kodialam fails to disclose a change in management function and instead teaches only one central manager, Kodialam necessarily fails to teach the derivation of database elements independent of which of the plurality of subnet managers assumes the master subnet manager function as claimed” (App. Br. 9, Reply Br. 3).

However, the Examiner finds that “Pfister teaches a replication failover method for maintaining data in the case of failure” which “requires that the master and standby nodes maintain separate copies of the data such that if the master fails, the standby can assume the master role using its own copy of data” (Ans. 11). The Examiner notes that “[w]hile Pfister explicitly discloses an explicit replication of database elements, Pfister is not specific about creating a derived version of database elements” and therefore, he

relies upon “Kodialam which discloses that a node can create a derived version of database elements related to multicast trees and forwarding tables” (*id.*). The Examiner also notes that since the “[S]pecification describes database elements as including trees and forwarding tables,” the “rejection does not seek to eliminate or replace the replication method of Pfister, but instead proposes modifying Pfister to provide an alternative or further way of achieving the replication method” (Ans. 11-12). The Examiner finds that “[w]hile indeed there is a central network management module, this module merely provides the data that allows a node to produce the derived database elements,” yet, “[t]he node is still creating its **own copy** of the database elements separate from other nodes by deriving the database elements using the provided information” (Ans.13-14). The Examiner notes that “Kodialam does not indicate any kind of dependency between the nodes N1-N11 in deriving database elements” (Ans. 16).

In Reply Brief, Appellants contend that “Kodialam teaches actual ‘dependence’ on the management module for any determination of derived database elements,” and therefore, “the Kodialam reference fails to teach computing ‘derived database elements independently of which of the plurality of subnet managers assumes the master subnet manager function” (Reply Br. 3).

To determine whether the combined teachings of Pfister and Kodialam teaches or would have suggested a method for managing a set of database elements in an InfiniBand architecture that includes “computing derived database elements independent of which of the plurality of subnet managers assumes the master subnet manager function” as recited in claim 1, we give the claim its broadest reasonable interpretation consistent with the

Specification. *See In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). However, we will not read limitations from the Specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Claim 1 does not place any limitation on what “database elements” means, includes, or represents. The Specification discloses that each standby subnet manager may generate derived database elements including a local identifier assignment, a tree determination (root for multi-cast tree selection), and a (unicast or multicast) forwarding table assignment (Dijkstra’s all-sources-single destination or all destinations-single source algorithm) (FF 1). This term (“database elements”), however, does not change the functionality of or provide an additional function to the “computing” step of claim 1, i.e., does not limit which subnet manager assumes the master subnet function.

Rather, this term is merely a description of each subnet manager’s respective “data.” When descriptive material is not functionally related to the claimed medium, the descriptive material will not distinguish the invention from the prior art in terms of patentability. *See In re Ngai*, 367 F.3d 1336, 1339 (Fed. Cir. 2004) and *In re Gulack*, 703 F.2d 1381, 1385 (Fed. Cir. 1983). We therefore interpret this term as merely a label describing a set of data. That is, we give “database elements” its broadest reasonable interpretation as merely data, as consistent with the Specification and as specifically defined in claim 1.

Pfister is directed to InfiniBand Architecture (IBA) subnet management having a *replication approach* for maintaining the data within the network; wherein, each subnet manager maintains a separate copy of the data having an *independent* data format which is synchronize with the

master subnet manager (FF 2). We find that the replication of data having an independent data format in the subnet manager and the master subnet manager represents replicating and updating independent data to be stored on the standby and master subnet managers (FF 2).

In addition, Kodialam is directed to a packet network having data packets that are routed along paths through a network of nodes interconnected by links from a source to a set of receivers based on a multicast routing tree (FF 3); wherein, a centralized network management system uses interior routing protocols to exchange network topology information with each network node, such that each node may derive its own forwarding table based upon the network topology information (FF 4). The forwarding table defines the network paths for sending each data packet to the next node in the path on to its destination (FF 5). Each node derives forwarding tables using various routing algorithms, such as, a Max-Multicast Flow algorithm or a Nearest Node First algorithm which both employ Dijkstra's shortest path algorithm (FF 6). Each of the nodes N1-N11 includes one or more corresponding routers that forward packets based on a forwarding table (FF 7). We find that derivation of a forwarding table at each node which includes data derived using various routing algorithms represents computation of derived database elements which are derived independent of which subnet manager assumes the master subnet manager function (FF 4-6). Thus, we conclude that "computing derived database elements independent of which of the plurality of subnet managers assumes the master subnet manager function" reads on Kodialam's network nodes which derive forwarding tables using various routing algorithms.

In view of our claim construction above, we conclude that the combination of Pfister and Kodialam at least suggests providing “computing derived database elements independent of which of the plurality of subnet managers assumes the master subnet manager function,” as specifically required by claim 1.

Though Appellants also contend that the combination “teaches away” (App. Br. 8), our reviewing court has held that “[a] reference may be said to teach away when a person of ordinary skill, upon [examining] the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *Para-Ordnance Mfg., Inc. v. SGS Importers Int’l, Inc.*, 73 F.3d 1085, 1090 (Fed. Cir. 1995) (quoting *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994)).

We agree with the Examiner’s finding that Appellants’ contention that Pfister discloses that a shared approach and a replication approach “are the only ways to achieve failover without data corruption” (App. Br. 8) fails to support *a direction divergent* from the claimed invention since “the derivation of database elements is actually more similar to the replication method of Pfister” (Ans. 14). Here, Appellants appear to have viewed the reference from a different perspective than the Examiner. The issue here is not whether Pfister discloses derived database elements at each standby subnet manager; but rather, whether a person of ordinary skill, upon reading Pfister, would be discouraged from using the derived forwarding tables as taught by Kodialam.

We also agree with the Examiner’s explicit motivation that combining the references would be obvious since it would motivate one “to create the

copies of data at the master and standby node as required for the replication failover method” (Ans. 11). The Supreme Court has stated that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007).

Thus, we find no error in the Examiner’s finding that the combination of Pfister’s InfiniBand Architecture having a replication approach where the nodes generate forwarding tables, as disclosed in Kodialam, produces subnet managers that compute derived database elements independent of which of the plurality of subnet managers assumes the master subnet manager function which would be obvious (Ans.4-5; FF 2-7).

Accordingly, we find that Appellants have not shown that the Examiner erred in rejecting claim 1 under 35 U.S.C. § 103(a) over Pfister in view of Kodialam; and independent claims 11 and 20 and claims 2-6, 8-10, 12-15, 17-19, 21-25, and 27-29 depending from claims 1, 11, and 20 which have been grouped therewith.

Claims 7, 16, and 26

Appellants argue that claims 7, 16, and 26 depending respectively from claims 1, 11, and 20 are patentable over the cited prior art for the same reasons asserted with respect to claims 1, 11, and 20 (App. Br. 11).

As noted *supra*, however, we find that the combination of Pfister and Kodialam *at least suggests* all the features of claim 1, 11, and 20. We therefore affirm the Examiner’s rejection of claims 7, 16, and 26 under 35 U.S.C. § 103 for the same reasons expressed with respect to parent claims 1, 11, and 20, *supra*.

V. CONCLUSION AND DECISION

The Examiner's rejection of claims 1-29 under 35 U.S.C. § 103(a) is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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